

REMARKS

Claims 35, 36, 38-50, and 61-64 are currently pending in this application. Although the claims have been amended herewith after Final rejection, the amendments to the specification and claims 48 and 49 are of a formal nature only and, thus, are deemed to be proper for entry after Final. With respect to the amendments to claims 35 and 39, one of the limitations found in dependent claim 39 (i.e., "and wherein the pasty composition is applied to the substrate in the form of discrete, substantially semi-spherical islets having a diameter of 10 μ to 1000 μ ") has been moved to amended independent claim 35. The prior art of record does not disclose the new and unexpected results of a substantially higher absorbent capacity of a substrate as a result of the use of small diameter islets, namely, those having diameters between 10 μ and 1000 μ . Evidence for the substantially improved absorbent capacity of the substrate thus claimed can be found on page 7, lines 15-20 of the present specification and in the enclosed Declaration. No new matter has been added by this Amendment. Entry of the above amendment is respectfully requested. The claim language added hereby to claim 35 does not require any additional significant consideration or any further search because it was already present in claim 39. Therefore, entry of this Amendment After Final is proper and respectfully requested.

As suggested by the Examiner, the specification has been amended by changing the term "fibre" to "fiber" to conform to United States spelling. This was accomplished with the substitute paragraphs on page 2 of this Amendment.

35 U.S.C. §112 Rejection

Claims 46, 48, 49, and 62 stand rejected under 35 U.S.C. §112, second paragraph, for indefiniteness. In claim 48, the term “cellulose-like polymer” has been deleted. In claim 49, the spelling of the term “fibre” has been changed to “fiber” and the term “petrojelly-like filling compound” has been deleted. The deficiencies in claims 46 and 62 were not mentioned in this Office Action. However, claims 46 and 62 were previously amended in the Amendment dated December 6, 2001. In view of the above amendments to the claims, reconsideration of this rejection is respectfully requested.

The present invention as claimed in amended independent claim 35 is directed to a substrate comprising a super-absorbent material applied to the substrate, wherein the super-absorbent material is obtained by allowing suitable monomers to polymerize in the presence of a catalyst in order to obtain a pre-cross-linked polymer solution. Next, a cross-linking agent containing two functional groups which are capable after thermal excitation of reacting within at least ten minutes with carboxylate or carbonic acid functional groups is added to the polymer solution to obtain a pasty composition. Finally, the pasty composition is subsequently applied on or in the substrate in the form of discrete, substantially semi-spherical islets having a diameter of 10 μ to 1000 μ and allowed to dry for one to three minutes at between 150°C and 200°C to form a swellable paste.

The prior art of record does not alone or in combination disclose or suggest a pasty composition applied to the substrate in the form of discrete, substantially semi-spherical islets having a diameter of 10 μ to 1000 μ . This coated layer of small diameter islets contributes to the new and unexpected results of a substantially higher absorbent capacity of a substrate. In Example 1 (page 2) of the accompanying Declaration of Dr. Harald R. Schmidt, super-absorbent material was applied to a substrate in a regular pattern of islets having a diameter of 250 μ . A swelling height of 1 mm was obtained which corresponds to the absorbent capacity of the

substrate, which is the same value disclosed on page 7, lines 15-20 of the present specification. The Declaration also compares the absorbency of a substrate having a full surface coated layer (i.e., no discrete particles) and a substrate having a regular pattern of islets with a diameter of about 1300 μ , both of which fall outside the claimed 10 μ to 1000 μ islet range. The substrate with the full surface coated layer (i.e., Comparison Example 1) resulted in a swelling height of only 0.2 mm. The substrate with the islets having a diameter of about 1300 μ (i.e., Comparison Example 2) similarly resulted in a swelling height of only 0.25 mm. The Declaration thus corroborates that substrates having a layer of islets outside the diameter range of 10 μ to 1000 μ do not demonstrate the new and unexpected good results attributable to substrates bearing 10 μ to 1000 μ islets according to the claims, and as already described of record in the present specification.

The Examiner has variously rejected the claims for asserted anticipation by or obviousness over U.S. Patent No. 4,076,663 to Masuda et al. (hereinafter “the Masuda patent”), U.S. Patent No. 4,154,898 to Burkholder, Jr. (hereinafter “the Burkholder patent”), U.S. Patent No. 4,017,653 to Gross (hereinafter “the Gross patent”), U.S. Patent No. 5,246,770 to Bottiglione et al. (hereinafter “the Bottiglione patent”), U.S. Patent No. 5,275,884 to Nishino et al. (hereinafter “the Nishino patent”), and/or U.S. Patent No. 4,321,997 to Miller (hereinafter “the Miller patent”).

The three primary references cited by the Examiner are the Masuda patent, the Burkholder patent, and the Gross patent. Except for the substrate having super-absorbent material in the form of discrete, substantially semi-spherical islets having a diameter of 10 to 1000 μ , the Examiner asserts that the substrates described in the three primary references are identical or slightly different than the substrate of the present invention. Therefore, the Examiner contends that it would have been obvious to optimize the shape and size of the super-absorbent

material to obtain a substrate having predetermined absorbency properties. Applicant respectfully disagrees with the Examiner's assertions on the basis of new and unexpected results detailed in the specification and accompanying Declaration, as summarized above.

The Masuda patent describes a highly water-absorbent resin produced by polymerizing cellulose with another monomer in the presence of a cross-linking agent and, optionally, adding a catalyst. The water-absorbent resin can be applied to various substrates by any known method, such as immersing (i.e., full surface coated layer) the substrate into an aqueous solution of the resin and subsequently dried. See Col. 6, lines 3-17. The Masuda patent discloses only a substrate having a full surface coated layer of absorbent material. A substrate having a full surface coated layer as described in the Masuda patent was tested for absorbency in Comparison Example 2 of the Declaration. The results indicate that a full surface coated layer has a substantially lower swelling height (i.e., 0.2 mm) in contrast to the swelling height (i.e., 1 mm) of the substrate having the regular pattern of islet with a diameter between 10 μ and 1000 μ . The motivation to optimize the shape and size of the absorbent surface coated layer cannot come from Applicant's specification. Therefore, there is no motivation, suggestion or reasonable expectation of success to modify the surface coated layer in the Masuda patent and arrive at the new and unexpected results of a substrate having five times the absorbent capacity.

The Burkholder and Gross patents are very similar to each other. The Burkholder patent describes water-soluble absorbent articles made from cross-linking carboxylic polymers, wherein the polymers are at least partially cross-linked and are then coated on a surface. The Gross patent describes a use of water-swellable absorbent articles made from cross-linked or cured polymer, wherein the cross-linking agent is added to a polymer solution and the solution is subsequently coated onto a surface and cross-linked further. Both the Burkholder and Gross patents describe a coating step that can be a complete coating (i.e., full surface coated layer) or a discontinuous coating. A discontinuous coating includes, for example, applying the

composition to a substrate in a pattern of large dots, squares, or grid lines to retain the inherent flexibility of the fibrous substrate and, at the same time, vastly improving its water absorbency (See col. 3, lines 5-17 of Burkholder and col. 4, lines 17-30 of Gross). By the use of the adjective “large” before the terms dots, squares or grid lines, the Burkholder and Gross patents teach away from the application of small diameter patterns (i.e., 10 μ -1000 μ) for increasing the water absorbency of a substrate. The Burkholder and Gross patents teach that as the size and/or diameter of a discontinuous coating pattern increases, the absorbent capacity of a substrate vastly improves versus a substrate having full surface coated layer. This teaching is contrary to the results identified in the present specification and illustrated in the Comparison Examples 1 and 2 of the accompanying Declaration, in which the continuous coating and the 1300 μ islets are shown to provide inferior absorbency compared to the claimed 10 μ to 1000 μ islets. One skilled in the art could not have learned the benefits associated with the 10 μ to 1000 μ islets absent consulting the present specification, and the obviousness rejections of claim 35 and any claim dependent thereon may thus be seen to be in condition for withdrawal.

The Bottiglione, Nishino, and Miller patents are directed to coal dust and absorbent substrates, respectively, and do not teach or suggest the 10 μ to 1000 μ islet diameters or the new and unexpected results attributable thereto. Because all the pending claims are now limited to the 10 μ to 1000 μ diameter size of islets, none of the Bottiglione, Nishino, or Miller patents is able to disclose or teach the present invention as claimed, and withdrawal of rejections based on these three references is respectfully requested.

CONCLUSION

Based on the foregoing amendments, remarks, and the enclosed Declaration Under 37 CFR §1.132, reconsideration of the rejections and allowance of pending claims 35, 36, 38-50, and 61-64 are respectfully requested. The showing of the Declaration merely corroborates new and unexpected results already disclosed in the specification, and claim 35 contains claim

language already before the Examiner prior to the Final Action. Applicant has thus herewith cemented their patentability case but has not submitted arguments or claim language that would require further consideration or search. Indeed, if the accompanying papers are not made of record for the purpose of prompt allowance, the Applicant will suffer financial hardship. The Examiner is respectfully requested to note that on December 6, 2001, Applicant identified that the accompanying Declaration was in preparation, but that the first Action after the Applicant's filing of the Continued Prosecution Application was a prompt Final Action issued before the comparative tests embodied in the accompanying Declaration could be completed and reported. Applicant does not dispute the Examiner's prerogative to issue a Final Action after the filing of the Continued Prosecution Application, but asks that because the present materials confirm the immediate allowability of the claims that entry and allowance be effected now.

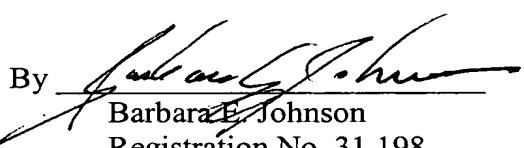
For the same reasons as just advanced, Applicant likewise requests entry of the accompanying Supplemental Information Disclosure Statement, which identifies prior art which is less pertinent than the prior art already of record.

After entering and allowing the claims above defended, the Examiner is also respectfully requested to forward this patent application to the Issue Branch.

Respectfully submitted,

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MARKED UP VERSION OF CLAIMS 35, 39, 48, AND 49

35. (Twice Amended) A substrate comprising a super-absorbent material applied to the substrate, wherein the super-absorbent material is obtained by allowing suitable monomers to polymerize in the presence of a catalyst in order to obtain a pre-cross-linked polymer solution, adding a cross-linking agent containing two functional groups which are capable after thermal excitation of reacting within at least ten minutes with carboxylate or carbonic acid functional groups to the polymer solution to obtain a pasty composition, subsequently applying the composition on or in the substrate and allowing the applied composition to dry for one to three minutes at between 150°C and 200°C to form a swellable paste, and wherein the pasty composition is applied to the substrate in the form of discrete, substantially semi-spherical islets having a diameter of 10 μ to 1000 μ .

39. (Twice Amended) The substrate as claimed in claim 35, wherein the pasty composition [is] applied to the substrate [in the form of discrete, substantially semi-spherical islets having a diameter of 10 to 1000 μ and] is allowed to dry and cross-link.

48. (Once Amended) The substrate as claimed in claim 35, wherein the super-absorbent material is selected from the group consisting of a cross-linked polyacrylate, a polyamide, [a cellulose-like polymer] or a combination thereof.

49. (Once Amended) The substrate as claimed in claim 35, wherein the substrate is one of a fabric, a non-woven, a paper, a film, aluminum tape, [a fibre or a petrojelly-like filling compound] or a fiber.